SUPPLEMENTARY MATERIAL

to the paper

Rule of law as a determinant of the export performance of Italian provinces

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Appendix A

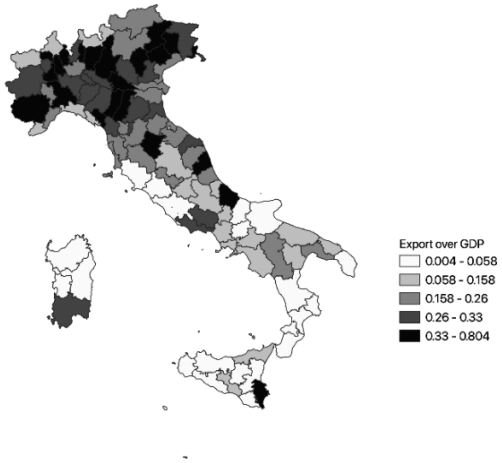

Figure A1: Spatial distribution of the export propensity (average 2004-2016).
Source: our elaborations. ISTAT data.

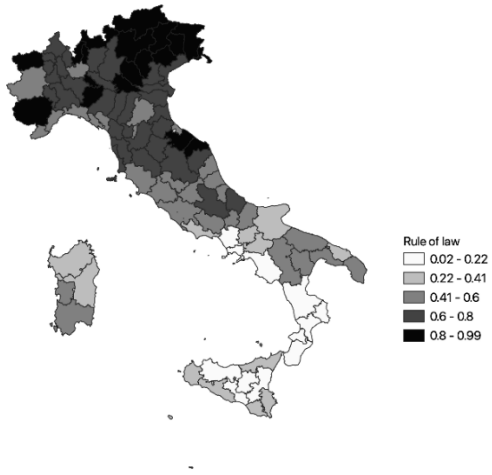

Figure A2: Spatial distribution of the rule of law (average 2004-2016).
Source: our elaborations. Nifo and Vecchione (2014) data.

Table A1: Variable definitions and sources.

Variable	Definition	Source
Export	Share of export over GDP	ISTAT 'Coeweb'
*Rule of law**	"Summarizes data on crime against persons or property, on magistrate productivity, trial times, the degree of tax evasion and the shadow economy."	Nifo and Vecchione (2014)
Import	Share of import over GDP	ISTAT Development Policy Statistics
Manufacturing employment	Share of employment in manufacturing as a percentage of total employment.	ISTAT Development Policy Statistics
Specialization	Herfindahl-Hirschmann concentration index to – two digits sectors – Ateco code (2007).	ISTAT Regional Economic Accounts
Graduates	Number of graduates as a percentage of provincial population.	ISTAT Development Policy Statistics
Banking	Number of large bank branches as a percentage of provincial total branches	Bank of Italy Statistical Database
Airport	Dummy variable that takes value 1 if in the province is present at least one airport.	ISTAT
Coast	Dummy variable that takes value 1 if the province is coastal.	ISTAT

* Nifo and Vecchione (2014), according to the strategy adopted by Kaufmann et al. (2011) for the Worldwide Governance Indicators (WGI), aggregate data on the number of property crimes, the number of crimes reported, trial times, magistrates' productivity, level of tax evasion and an index representative of the underground economy. The method adopted by the authors to build this rule of law indicator has three steps. First, each elementary index (I) is normalized so that it ranges between 0 and 1. Second, an analytical hierarchy process (AHP) elaborated by Saaty (1980, 1992) is implemented to assign a weight (h) to each normalized index. Once the weights of each index have been defined, the aggregation function used to determine the indicator of the provincial rule of law is:

$$ruleoflaw_i = \sum_{j=1}^{m} I_{ji}\, h_j \qquad (1)$$

where i = 1,…, 103 (i.e. the Italian provinces), while j = 1,…, 6 (i.e. the sub-indexes).

Table A2: Summary statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max
			Italy					*North*		
Export	1,339	0.213	0.159	0.003	1.188	598	0.287	0.114	0.060	0.605
Rule of law	1,339	0.569	0.241	0	1	598	0.740	0.137	0.308	1
Import	1,339	0.185	0.180	0.006	1.803	598	0.011	0.042	-0.211	0.128
Manufact. employment	1,339	0.171	0.079	0.041	0.389	598	0.214	0.073	0.050	0.389
Specializ.	1,339	0.160	0.014	0.126	0.223	598	0.162	0.015	0.134	0.213
Graduates	1,339	18.914	5.276	5.300	37.500	598	19.820	5.299	9.300	37.500
Banking	1,339	0.378	0.16	0.046	0.914	598	0.398	0.16	0.046	0.914
Airport	1,339	0.398	0.489	0	1	598	0.304	0.461	0	1
Coast	1,339	0.553	0.497	0	1	598	0.370	0.483	0	1
			Centre					*South*		
Export	273	0.238	0.147	0.028	0.952	468	0.106	0.158	0.003	1.188
Rule of law	273	0.614	0.148	0.249	0.967	468	0.327	0.180	0	0.757
Import	273	0.008	0.037	-0.104	0.100	468	0.009	0.042	-0.232	0.238
Manufact. employment	273	0.182	0.073	0.041	0.379	468	0.110	0.048	0.044	0.287
Specializ.	273	0.152	0.011	0.126	0.184	468	0.163	0.013	0.139	0.223
Graduates	273	20.504	5.041	8.500	37.000	468	16.831	4.711	5.300	32.200
Banking	273	0.352	0.135	0.138	0.68	468	0.368	0.171	0.086	0.784
Airport	273	0.571	0.496	0	1	468	0.861	0.346	0	1
Coast	273	0.333	0.472	0	1	468	0.472	0.500	0	1

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Table A3: Correlation matrix of the variables used in the econometric models.

	Export	Rule of law	Import	Manuf.	Specializ.	Graduates	Banking	Airport	Coast
Export	1								
Rule of law	0.553	1							
Import	0.672	0.222	1						
Manuf.	0.675	0.673	0.203	1					
Specializ.	0.208	-0.044	0.011	0.259	1				
Graduates	0.169	0.225	0.069	0.041	-0.185	1			
Banking	0.109	-0.083	0.213	-0.096	0.082	0.112	1		
Airport	-0.255	-0.166	-0.077	-0.308	-0.109	0.048	-0.051	1	
Coast	-0.374	-0.464	-0.143	-0.522	-0.053	-0.095	0.182	0.212	1

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Table A4: OLS estimation results by macro-areas (North, Centre, and South).

Sample of Italian provinces	OLS North (I)	OLS Centre (II)	OLS South (III)
$Export_{i,t-1}$	0.8842***	0.8790***	0.8635***
	(0.0323)	(0.0297)	(0.0248)
Rule of law	0.0473	-0.023	0.0897
	(0.0349)	(0.0814)	(0.0695)
Import	0.0369***	0.0640***	0.1087***
	(0.0102)	(0.0201)	(0.0216)
Manufacturing employment	0.0735**	0.1293***	0.1693***
	(0.0345)	(0.044)	(0.0409)
Specialization	0.0745	0.1387	0.0966
	(0.0646)	(0.1444)	(0.1347)
Graduates	0.0331	0.0556	0.0393
	(0.0309)	(0.0391)	(0.0553)
Banking	0.0107	0.0717**	0.0353
	(0.009)	(0.0319)	(0.0224)
Airport	0.0005	-0.0429**	0.0291
	(0.0084)	(0.0167)	(0.0263)
Coast	0.0012	0.0231	0.0956***
	(0.0114)	(0.0173)	(0.0254)
Constant	0.0439	0.3575	0.421
	(0.1074)	(0.2601)	(0.3082)
Observations	552	252	432
Provinces	46	21	36
Time effects	Yes	Yes	Yes
Provincial effects	No	No	No
R^2	0.963	0.974	0.978

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Note: *statistically significant at the 10%; **statistically significant at 5%; *** statistically significant at 1%. Standard errors clustered by provinces are given in parenthesis. Except for the *rule of law*, all the other variables are expressed in logarithm.

Table A5: FE estimation results by macro-areas (North, Centre, and South).

Sample of Italian provinces	FE North (IV)	FE Centre (V)	FE South (VI)
$Export_{i,t-1}$	0.5126***	0.6181***	0.6809***
	(0.0603)	(0.057)	(0.0597)
Rule of law	-0.0793	0.1302	0.3128
	(0.1191)	(0.1557)	(0.1944)
Import	0.1785***	0.3073***	0.2257**
	(0.0553)	(0.0787)	(0.084)
Manufacturing employment	0.1106	-0.3240	0.1425
	(0.1258)	(0.2139)	(0.1719)
Specialization	0.1719	0.3925	0.6852*
	(0.2297)	(0.4196)	(0.3721)
Graduates	-0.0098	-0.0253	-0.0269
	(0.0423)	(0.0586)	(0.0624)
Banking	0.0251*	0.0659	0.0773
	(0.0135)	(0.0577)	(0.0591)
Airport			
Coast			
Constant	0.2922	0.1851	1.3171
	(0.2960)	(0.9212)	(0.9341)
Observations	552	252	432
Provinces	46	21	36
Time effects	Yes	Yes	Yes
Provincial effects	Yes	Yes	Yes
R^2	0.713	0.770	0.690
Hausman FE/RE (p>chi2)	162.7 (0.00)	73.5 (0.00)	57.6 (0.00)

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Note: *statistically significant at the 10%; **statistically significant at 5%; *** statistically significant at 1%. Standard errors clustered by provinces are given in parenthesis. Except for the *rule of law*, all the other variables are expressed in logarithm.

Appendix B: Robustness check of the spatial estimates

Table B1: dySAR and dySDM estimation results for all the Italian provinces.

	dySAR (K=2)	dySDM (K=2)	dySAR (K=4)	dySDM (K=4)	dySAR (K=6)	dySDM (K=6)
Dependent variable	Export (VII)	Export (VIII)	Export (IX)	Export (X)	Export (XI)	Export (XII)
$Export_{i,t-1}$	0.7454*** (0.0126)	0.7465*** (0.0127)	0.7477*** (0.0127)	0.7523*** (0.0131)	0.7517*** (0.0123)	0.7540*** (0.0124)
Rule of law	0.1596*** (0.06)	0.1859*** (0.061)	0.1669*** (0.0605)	0.1770*** (0.064)	0.1686*** (0.0606)	0.1654*** (0.0622)
Import	0.1850*** (0.0071)	0.1837*** (0.0074)	0.1905*** (0.0071)	0.1898*** (0.0076)	0.1898*** (0.007)	0.1902*** (0.0075)
Manufacturing employment	0.0749 (0.0649)	0.0945 (0.0789)	0.0488 (0.0658)	0.0563 (0.0768)	0.0404 (0.0653)	0.0481 (0.0764)
Specialization	0.3336*** (0.1279)	0.4203*** (0.1505)	0.3320*** (0.1278)	0.3899*** (0.1424)	0.3367*** (0.1298)	0.3723*** (0.1371)
Graduates	-0.0116 (0.0284)	-0.0243 (0.0301)	-0.009 (0.0281)	-0.0078 (0.0296)	-0.0083 (0.028)	-0.0042 (0.0294)
Banking	0.0672*** (0.0168)	0.0521** (0.0232)	0.0629*** (0.0169)	0.0319 (0.0227)	0.0585*** (0.0169)	0.0380* (0.0204)
ψ	-0.0164 (0.0376)	0.0021 (0.0392)	-0.0203 (0.0418)	-0.0007 (0.0442)	-0.0655 (0.0524)	-0.0555 (0.0549)
ρ	-0.0724** (0.0333)	0.0624 (0.038)	-0.0435 (0.0407)	0.0594 (0.045)	0.0458 (0.0541)	0.0183 (0.0588)
WRule of law		-0.1545 (0.1066)		-0.0054 (0.1161)		0.0152 (0.1418)
WImport		-0.0176 (0.025)		0.0211 (0.0278)		0.0453 (0.0429)
WManufacturing employment		-0.1075 (0.1041)		-0.184 (0.1183)		-0.2030* (0.1221)
WSpecialization		-0.6094*** (0.2152)		-0.5626** (0.2323)		-0.5779** (0.2533)
WGraduates		-0.0495 (0.0582)		0.0353 (0.0616)		0.0579 (0.0888)
WBanking		0.0269 (0.0322)		0.0746** (0.0361)		0.0521 (0.0387)
Observations	1236	1236	1236	1236	1236	1236
Provinces	103	103	103	103	103	103
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Provincial effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.971	0.962	0.975	0.968	0.977	0.972
Moran's I (p-value)	0.023 (0.48)	0.005 (0.73)	0.015 (0.57)	0.011 (0.63)	0.018 (0.53)	0.011 (0.64)

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Note: *statistically significant at the 10%; **statistically significant at 5%; *** statistically significant at 1%. Standard errors clustered by provinces are given in parenthesis. Except for the *rule of law*, all the other variables are expressed in logarithm.

Appendix C: Sensitivity analysis

Table C1: Sensitivity analysis estimation results (SYS-GMM).

	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM
Dependent variable	Export (XIII)	Export (XIV)	Export (XV)	Export (XVI)	Export (XVII)	Export (XVIII)	Export (XIX)
$Export_{i,t-1}$	0.9650*** (0.0289)	0.7709*** (0.0553)	0.7760*** (0.061)	0.7849*** (0.0628)	0.7828*** (0.0635)	0.7836*** (0.064)	0.7725*** (0.0658)
Rule of law	0.4101*** (0.1318)	0.2117* (0.1184)	0.2511* (0.1365)	0.2693** (0.1326)	0.2604** (0.1312)	0.2735** (0.131)	0.3321** (0.1406)
Import		0.1841*** (0.045)	0.1578*** (0.0412)	0.1519*** (0.0412)	0.1535*** (0.0415)	0.1496*** (0.0414)	0.1528*** (0.0418)
Manufacturing employment			0.1413* (0.0733)	0.1258 (0.078)	0.1302* (0.077)	0.1303* (0.0768)	0.1551** (0.0788)
Specialization				0.0299 (0.1255)	0.0286 (0.1206)	0.0228 (0.1211)	0.0187 (0.1208)
Graduates					0.004 (0.0335)	0.0018 (0.0328)	-0.0013 (0.0321)
Banking						0.0221 (0.0182)	0.0351* (0.0181)
Airport							-0.0031 (0.0217)
Coast							0.0558** (0.0244)
Constant	-0.1769 (0.1177)	-0.2709** (0.1126)	0.0542 (0.1795)	0.072 (0.1627)	0.0703 (0.1695)	0.0749 (0.182)	0.0536 (0.1741)
Observations	1236	1236	1236	1236	1236	1236	1236
Provinces	103	103	103	103	103	103	103
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Moran's I (p-value)	0.082 (0.04)	0.093 (0.02)	0.064 (0.11)	0.074 (0.06)	0.072 (0.07)	0.078 (0.07)	0.071 (0.07)
Arellano-Bond (1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano-Bond (2)	0.792	0.702	0.727	0.725	0.721	0.737	0.742
N. of instruments	76	77	78	79	80	81	83
Hansen's J test	0.243	0.131	0.272	0.256	0.250	0.235	0.314

Source: our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.

Note: *statistically significant at the 10%; **statistically significant at 5%; *** statistically significant at 1%. Standard errors clustered by provinces are given in parenthesis. Except for the *rule of law*, all the other variables are expressed in logarithm.

Appendix D

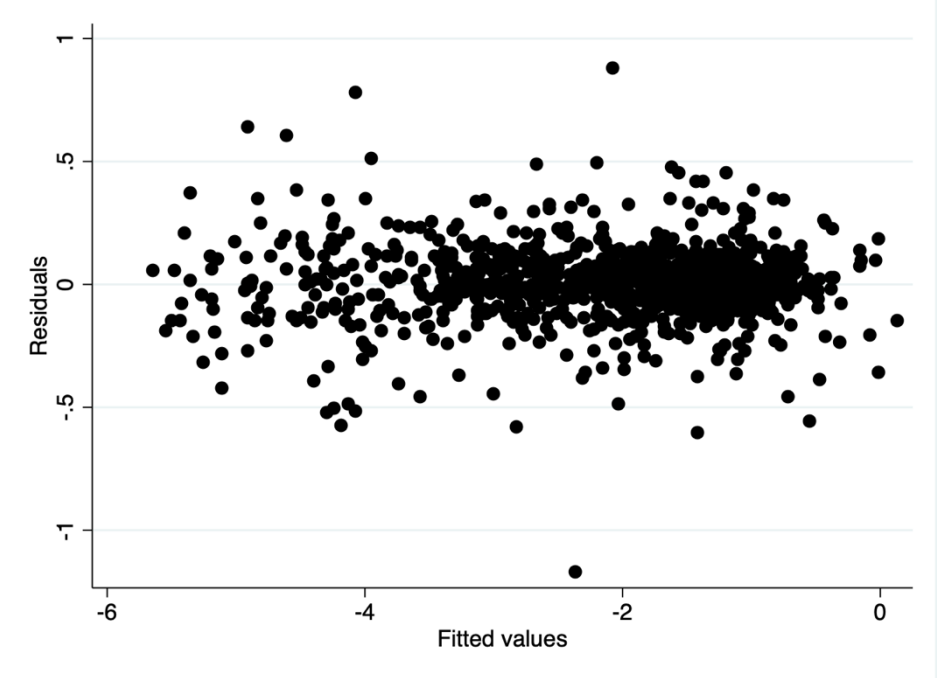

Figure D1: Graph of the residuals against the fitted values of the dependent variable.
Source: Our elaborations. ISTAT, Bank of Italy, and Nifo and Vecchione (2014) data.